

A Message from the Chair

The American Physical Society's Division of Chemical Physics (DCP) is an organizational capability for the broad discipline of chemical physics. Chemical Physics as a named activity goes back to the founding of the Journal by Harold Urey and his colleagues in 1933, and is one of the broadest and most active areas of research in contemporary physics, chemistry, biochemistry, materials science, and The time scales of interest in chemical physics run over 20 orders of magnitude, the length scales over at least 12 orders of magnitude. The field has a remarkable richness of methodology, areas of interest, applications, interpretation, and understanding.

Given this scope, the Division tries to focus its overall attention, and not to require too much time of its members. We try to keep this newsletter short, and to focus on defining issues for the field, on helping to develop the human capital in the field, and on running the best possible scientific meetings.

DCP is undertaking a few new initiatives, including an attempt to work with APS to streamline the organization of the March meeting (and perhaps even allow time for lunch), an extension of the Graduate Student Travel Awards to support more diversity within the program, the stabilization of the Prizes awarded by the APS through the Division (Broida, Langmuir, Plyler).

The March meeting this year will be held in Baltimore, and Hai-Lung Dai has assembled a fantastic program. It will be a week of challenging, satisfying science and I urge members both to attend, and if possible to bring young associates — the excitement and depth of the science will be very rewarding for all of us.

Of course there is an opportunity for contributed talks, and this is an excellent venue for graduate students, postdoctorals and beginning researchers to air their ideas and get some very positive (and occasionally very challenging) feedback. The Division maintains its Graduate Student Travel Awards program; this can help to lessen the financial burden of young people attending the meeting, and also looks pretty good on their resumes. Baltimore is a fascinating place, and the meeting should really be great fun.

We would be very interested in hearing from members of the division on several different issues: how can DCP help workers in chemical physics obtain their objectives? what can we do to be more efficient? what can we do to be more helpful? how do we make the meetings more accessible and rewarding? what new activities might the Division undertake?

Finally, the meetings will only be as good as the topics that are addressed. While the Executive Committee does its best to come up with challenging and interesting symposium topics, some of the best ones are suggested by the membership. Therefore please forward your ideas for any improvements in the Division, and more specifically for focused topic ideas for the 2007 March meeting, to any of the officers of the Division.

The easiest job in the Division is being the Chair. This is because of excellent work by the Division Executive Committee, and remarkable insight and deftness from Emily Carter, Bruce Garrett and Hai-Lung Dai. I am grateful to all of them, and to the members of the Division, for helping to keep Chemical Physics as a strong and vibrant part of APS.

Best wishes for the holiday season.

See you in Baltimore,

Mark Ratner

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| • On-line ballots for new DCP officers: | January 6, 2006 |
| • Early registration for March meeting: | January 14, 2006 |
| • APS Fellowship nominations for DCP: | February 11, 2006 |

March APS Meeting, Baltimore, March 13-17, 2006

The March APS 2006 meeting will be held March 13-17 in Baltimore, MD. Information about the meeting is available on the APS web site at <http://www.aps.org/meet/MAR06/index.cfm>. The deadline for early registration at the reduced fee is January 20, 2006.

The annual DCP business meeting is also part of the March meeting and will include short reports of DCP activities, presentation of Certificates of Fellowship to new APS Fellows from the DCP, and introduction of student travel fellowship awards. All members are invited to attend. The date of the general business meeting will be published in the January newsletter.

The APS Office of Public Affairs (OPA) is organizing Congressional visits during the meeting. More information is available at <http://www.aps.org/meet/MAR06/index.cfm#cong>

The DCP Special Focus Topics for the March 2006 meeting include the following.

11.8.1. Promises and Challenges in Chemical Dynamics (Informal memorial of Richard Bersohn)

Organizers: Laurie Butler (U. Chicago) and Louis Brus (Columbia U.)

Description: Studies of chemical dynamics focus on how inter- and intramolecular forces control the rates and product branching of chemical reactions and energy transfer processes. While detailed experimental and theoretical work focused on gas phase processes starting in the mid 1900's such as the contributions from Rich Bersohn's laboratory, modern chemical dynamics encompasses a wide range of chemical processes including processes at interfaces and in condensed phases. Advances in optical spectroscopies have yielded new insight into these complex systems. We encourage contributed oral presentations across the fields of chemical dynamics and kinetics, including both theoretical and experimental studies of dynamics in atmospheric and combustion processes, at interfaces, and in condensed phases. We especially encourage contributions which give new physical/chemical insight into the reactions and energy transfer processes in polyatomic molecules and complex species including mesoscopic, nanoscale and biomolecular systems.

11.8.2. Aerosols, Clusters and Droplets: Physics and Chemistry of Nanoobjects (informal memorial of Roger Miller)

Organizers: Roger Miller (deceased), Frank Stienkemeier (U. Freiburg) and Michael Duncan (U. Georgia)

Description: This symposium will bring together researchers from a number of important fields of physics and chemistry, dealing with the study of nanoscaled atomic and molecular clusters. Particular emphasis is given to (1) metal clusters as model systems for studying bulk properties, including the onset of conductivity, magnetism and reactivity with increasing size, (2) quantum clusters, including hydrogen and doped helium nanodroplets, their physical, photophysical and chemical properties at low temperatures, and (3) molecular clusters, including structure, dynamics and reactivity. The symposium will cover both experiment and theory. Applications of these studies to biochemistry, atmospheric science, catalysis and materials science will be emphasized.

11.8.3. Ultrafast and Ultrahigh Field Chemistry

Organizers: Robert Levis (Temple U.) and Kenji Ohmori (Inst. Mol. Sci. Okazaki)

Description: This symposium will explore the limits of manipulating and probing atomic and molecular wave functions using designed laser radiation. Unprecedented control of atoms and molecules is possible with the combination of strong laser fields and coherent excitation on the picosecond to attosecond timescale. Theoretical and experimental investigations of ultrafast and ultrahigh field chemistry demonstrating new quantum phenomena are the focal points of this symposium. Our current understanding of the underlying physical principles and the state-of-the-art applications of these phenomena will be highlighted. The role of coherence and decoherence in ultrafast and ultraintense laser processes will also be discussed. Topics at the frontier of laser chemistry and physics to be presented include: strong field chemistry; coherent control; attosecond phenomena; nonadiabatic processes; charge transfer-mediated control; strong field imaging of single molecules; solution phase control; and atom- and molecule-based information processing.

11.8.4. Frontiers in Computational Chemical Physics

Organizers: Andrew Rappe (U. Pennsylvania) and Jeffrey Saven (U. Pennsylvania)

Description: This symposium will focus on the development and application of theoretical and computational methods for better understanding and predicting chemical and physical phenomena. New developments in the core methodologies of electronic structure, statistical mechanics, and chemical dynamics will be discussed, as well as how these may be integrated into new approaches for better understanding systems with many degrees of freedom in complex environments. Such theoretical methods may be used not only to inform and motivate experiments but also to guide the design of functional systems with desired chemical and physical properties.

11.8.5. Chemical and Spectroscopic Applications of Nonlinear Optics

Organizers: Nancy Levinger (Colorado St. U.) and Hongfei Wang (U. Sci. Tech. China)

Description: The use of nonlinear optical techniques for interrogating molecular systems has surged as reliable short pulsed and high intensity light sources have become readily available. This focus session features applications of nonlinear optical techniques to problems in chemical and molecular structure and dynamics in various phases, especially in the condensed phase, at interfaces and in systems of biological importance. The coherent nature of these techniques facilitates their application to detailed interactions and dephasing processes in complex molecular systems. The session will include recent developments in related fields, combining both experiment and theory, and exploring new possibilities for emerging applications.

11.8.6. Physical Chemistry of Nanoscale Systems

Organizers: Tim Lian (Emory U.) and Jin Zhang (UC Santa Cruz)

Description: The object of this symposium is to bring together experimentalists and theoreticians working in the frontier of physical chemistry of nanoscale systems. Nanoscale systems of interest include various nanostructures (nanoparticles, nanotubes, and their assemblies) of metal, semiconductor and composite materials. The topics of interest include: novel materials synthesis and characterization, spectroscopy and dynamics of metals and semiconductors, spectroscopy and

dynamics (electron transfer, energy relaxation and solvation) at nanoparticle interfaces, conductance of single particles, and single particle spectroscopy.

11.8.7. Surface and Interfaces in Electronic Materials and Electrochemical Processes

Organizers: Eric Borguet (Temple U.) and Yuh-Lin Wang (Inst. Atomic Mol. Sci. Taipei)

Description: The focus sessions on surface and interfaces in electronic materials and electrochemical processes will address the following topics and their related issues: 1) electronic and chemical processes at organic semiconductor interfaces; 2) high k dielectric interfaces; 3) fabrication of functional interfaces and nanostructures by electrochemical processes; 4) surface-template and quantum-size effects in the growth of electronic materials; 5) charge transfer at electrochemical interfaces; and 6) self-assembly at electrochemical interfaces.

11.8.8. Spectroscopy of Biomolecules: From Isolated Molecules to the Cell Environment (cosponsored with the Division of Biological Physics)

Organizers: Feng Gai (U. Pennsylvania) and David Pratt (U. Pittsburgh)

Description: The last few years have witnessed tremendous progress in the application of state-of-the-art spectroscopic methods to challenging problems in biological systems, ranging from probing the conformation and energetics of biomolecules in gas phase, to the development of advanced theoretical methods, to imaging single-molecule events in live cells. The goal of this symposium is to bring together scientists with interests in the application of these techniques to the study of the structures and dynamical properties of biomolecules. Our primary objective is to provide an interdisciplinary forum for the sharing and synthesis of new ideas. The symposium will highlight many of the new frontiers areas in this field, including (but not limited to) 1. Biomolecules in gas phase; 2. Protein and peptide dynamics; 3. Solvent control in enzyme function; 4. Microwave, terahertz, infrared, and UV/Vis spectroscopy; 5. Nonlinear laser spectroscopy; 6. Two- and three-dimensional spectroscopies; 7. Biological applications of mass spectrometry; 8. Single-molecule spectroscopy and microscopy; 9. *In vivo* imaging; and 10. Protein mis-folding and amyloid formation. Advances in understanding the energy landscapes of complex systems. Both experimental and theoretical contributions in these and related areas are welcome.

Congratulations to APS Prize Winner

The Division of Chemical Physics extends its congratulations to the awardee of the APS Earl K. Plyler Prize. The Plyler Prize is administered by the DCP and funded by generous contributions from the George E. Crouch Foundation and Spectra-Physics (<http://www.spectra-physics.com/>).

Mark A. Johnson, Yale University, was awarded the Earl K. Plyler Prize for the applications of spectroscopic methods towards the understanding of solvation on the microscopic scale, especially the solvation of protons and hydroxide anions by water.

More information about winners of APS prizes and awards in 2006 is available on the web at <http://www.aps.org/praw/06winners.cfm>

Fellowship Committee and Nominations

Nominations for APS Fellowship to be considered by the DCP Fellowship Committee should be made before February 11, 2006. Thanks go to this year's committee, David Beratan (chair), Jim Lisy and Marsha Lester. Instructions for submitting a nomination for consideration next year are included on the APS web site (<http://www.aps.org/fellowship/fellinfo.html>).

DCP Membership

Membership in the American Physical Society's Division of Chemical Physics allows you to directly support a primary forum for chemical physics research. The status and influence of the DCP within the APS is dependent on the number of DCP members. Increasing DCP membership is crucial to preserving this important professional asset. If you are not a DCP member, we encourage you to join on the web (<http://www.aps.org/memb/unitapp.html>) or by phone (301-209-3280).

Election of New DCP Officers

We are fortunate to have an excellent slate of candidates for the positions of Vice-Chair and Member-at-Large of the Executive Committee. These positions are for three-year terms. The Vice-Chair becomes the Chair-Elect in the second year of the term and Chair in the final year. The main duties of the Chair are to provide general leadership for the Division, to make sure that the various Division committees are staffed, and to preside at the business meetings of the Division. The most time-consuming job of the Chair-Elect is to organize the DCP symposia for the upcoming National meeting. The duties of the Member-at-Large are less well defined, other than to attend the March meeting. In the past they have organized the student fellowship program, assisted in membership recruiting, and helped with the organization of National meetings. All members of the Executive Committee, which includes the DCP Officers as well as the Members-at-Large, meet at the March APS meeting to help plan DCP activities for the coming year. We are indebted to the Nominating Committee, consisting of Casey Hynes, Paul Houston, and John Hemminger, for their efforts to enlist the excellent candidates for both positions.

The election will be conducted using the APS web-based voting system. DCP members will be emailed a voting announcement with a link to the voting system. The deadline for casting your on-line ballot is December 23, 2005.

Candidates for Vice-Chair

V. ARA APKARIAN: Professor and Chair, Department of Chemistry, University of California, Irvine. B.S., USC, 1976; Ph. D., Northwestern 1980; Postdoctoral Fellow, Northwestern 1980-1981, Cornell, 1981-1983. Fellow of the American Physical Society, 1994; Humboldt Prize, 1996; Fellow of the American Association for the Advancement of Science, 2004; Chairman of Chemistry, UCI, since 2004.

RESEARCH INTERESTS: Photophysics and chemical dynamics in condensed media; Ultrafast nonlinear spectroscopy experiments and their semiclassical treatment in many-body systems; Quantum information, control and decoherence; Superfluidity on molecular scales; Chemistry at the space-time limit.

Web site: <http://www.chem.uci.edu/people/faculty/aapkaria/>

A. WELFORD (WILL) CASTLEMAN, JR. Eberly Distinguished Chair in Science, Evan Pugh Professor, Departments of Chemistry and Physics, The Pennsylvania State University, 1982-present; B.Ch.E., Rensselaer Polytechnic Institute, 1957; Scientist, Brookhaven National Laboratory, 1958-1975; Ph.D. Polytechnic Institute of Brooklyn, 1969; Professor and Fellow of CIRES, Univ. of Colorado, 1975-82; Sherman Fairchild Distinguished Scholar, Cal Tech, 1977; Senior Scientist Awardee, Japanese Society for the Promotion of Science, 1983, 1997; Fellow, American Association for the Advancement of Science, 1985; Fellow, American Physical Society, 1985; U.S. Senior Scientist von Humboldt Award, 1986, 1998; American Chemical Society Award for Creative Advances in Environmental Sciences, 1988; Fulbright Senior Scholar Award, 1989; Fellow of the New York Academy of Sciences, 1998; Fellow of the American Academy of Arts and Sciences, 1998; Member, National Academy of Sciences, 1998; Wilhelm Jost Memorial Lectureship Award of the German Chemical Society (Bunsen-Gesellschaft fuer Physikalische Chemie), 2000.

RESEARCH INTERESTS: Chemical Physics: Spectroscopy, bonding, molecular properties, and reactivity of clusters and condensed matter of large finite dimensions; ultrafast laser techniques applied to studies of the dynamics of clusters and nanoscale systems, multiphoton ionization, and solvation effects on cluster properties; applications of cluster research to catalysis and materials science through the concept of cluster assembled nanoscale materials.

Web site: <http://research.chem.psu.edu/awcgroup/>

Candidates for Member-at-Large of the Executive Committee

ANDREA LIU. Professor, Department of Physics and Astronomy, University of Pennsylvania, Philadelphia, PA, 2004-present. Assistant, Associate and Full Professor, UCLA Department of Chemistry and Biochemistry, 1994-2004. A. B., University of California, Berkeley, 1984. Ph. D., Cornell University, 1989. APS Fellow, 2004.

RESEARCH INTERESTS: Statistical mechanics of condensed phases and biophysical systems. Theoretical and computational studies of problems ranging from jamming in glassforming liquids, foams and granular materials, to biophysical self-assembly of actin in crawling cells.

Web site: <http://www.physics.upenn.edu/facultyinfo/liu.html>

GILBERT M. NATHANSON. Professor, Department of Chemistry, University of Wisconsin, Madison, WI. B. S., Yale University, 1979. Ph. D. Harvard University, 1985. Miller Postdoctoral Research Fellow, University of California, Berkeley, 1985. APS Fellow, 2002. AAAS Fellow, 2005.

RESEARCH INTERESTS: Molecular beam scattering from liquid surfaces; gas-liquid collisions and energy transfer; interfacial solvation and acid-base reactions; stratospheric ozone depletion mediated by sulfuric acid aerosols; surfactant control of interfacial reactivity.

Web site: <http://www.chem.wisc.edu/people/profiles/Nathanson.php>

Meetings of Possible Interest to DCP Members

Gordon Research Conference on Molecular & Ionic Clusters

February 19-24, 2006

Holiday Inn, Ventura, CA

Chairs: Michael Duncan & Sotiris Xantheas

Email: MADUNCAN@UGA.EDU

SOTIRIS.XANTHEAS@PNL.GOV

URL: <http://www.grc.org/programs/2006/molionic.htm>

Gordon Research Conference on Atomic and Molecular Collisions

July 9-14, 2006

Colby-Sawyer College, New London, NH

Chair: David R. Yarkony

Vice Chair: Arthur G. Suits

Email: YARKONY@JHU.EDU

ARTHUR.SUITS@SUNYSB.EDU

URL: <http://www.grc.org/programs/2006/atomic.htm>

Gordon Research Conference on Chemistry at Interfaces

July 9-14, 2006

University of New England, Biddeford, ME

Chair: Nicholas D. Spencer

Vice Chair: Scott S. Perry

Email: NICHOLAS.SPENCER@MAT.ETHZ.CH

PERRY@UH.EDU

URL: <http://www.grc.org/programs/2006/interfac.htm>

Workshop on Attosecond Science

July 31 – September 15, 2006

Kavli Institute for Theoretical Physics, UC-Santa

Barbara

Organizers: André Bandrauk, Nat Fisch, and Anthony Starace

Email: ASTARACE1@UNL.EDU

URL: <http://www.kitp.ucsb.edu/activities/auto2/?id=333>